

PREPARING TO READ

Understanding statistical terms

In academic reading, you will often come across statistical terms, so it is important to be familiar with the most common ones. One of the most basic statistical terms is *correlation*. A correlation tells you how closely two events or conditions (often called *variables*) are related. The highest possible correlation is 1.0, which means that every time that one condition or event is present, the other is also. Lower levels of correlation range from 0.9 downwards. Scientists are often looking for significant or high correlations in their research because a high correlation suggests that there may be a causal relationship between two variables.

Study Figure 6.1 in the text and answer the following questions.

- 1 What is being correlated?
- 2 According to this graph, is there a high correlation? A low correlation?
- 3 Describe how you think the data were collected for this graph.

Skimming for main ideas

1► Skim through the text and find the paragraph in which each of the following appears. Write the number of the paragraph in the blanks.

- ___ a data about IQ scores gathered using a cross-sectional method
- ___ b an example to show why the best answer to questions about IQ and age is “It depends”
- ___ c a definition of the longitudinal method of gathering data
- ___ d a discussion about the usefulness of giving IQ tests to young children
- ___ e definitions of fluid intelligence and crystallized intelligence
- ___ f a comparison of the IQ scores of young children with their adult IQ scores

2► Compare answers with a partner.

NOW READ

Now read the text “Age Differences and IQ.” When you finish, turn to the tasks that begin on page 119.

2 AGE DIFFERENCES AND IQ

You know a great deal more now than you did when you were 12 years old. You knew more when you were 12 than you did when you were 10. You learned a lot in fifth and sixth grades. In fact, when you were 12, you probably believed that you knew more than your parents did! Certainly what we know generally increases with age, but what we "know" is not a direct measure of intelligence.

One interesting question is whether the IQ scores of young children can predict their IQ scores at ages 14 or 40 or 80. As it happens, the measured IQs of individuals much younger than 7 do not correlate very well with later IQ scores. We cannot put too much importance on IQs earned by 4-year-olds as predictors of adult intellectual abilities. The data in Figure 6.1 are typical in this regard. They show the correlations of IQ scores earned at ages 16 to 18 with IQ scores at some younger age. Notice that when previous testing was done before 7 or 8 years of age, the correlations are quite low.

This does not mean that the testing of young children is without purpose. Determining the intellectual abilities of young children is often very useful, particularly if there is some concern about retardation or if there is some thought that the child may be exceptional or gifted. The resulting scores may not predict adult intelligence well, but they do serve as a guide to assess the development of the child compared to other children. Even taken as a rough guide or indicator, knowing as early as possible that there may be some intellectual problem with a youngster is useful information.

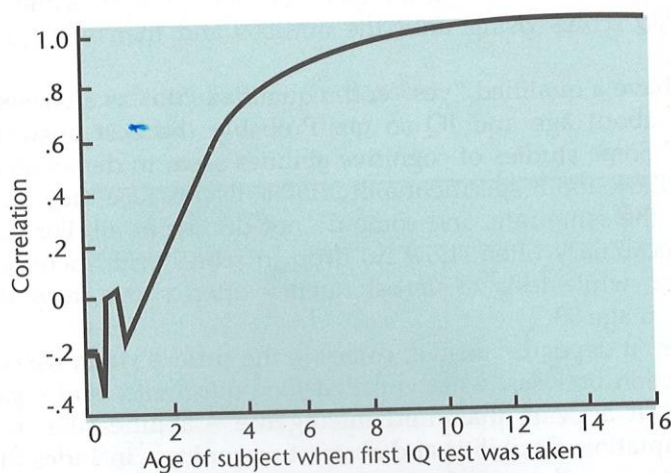


Figure 6.1 Correlations of IQ scores earned by males ages 16 to 18 with IQ scores earned at a younger age by the same subjects (from Bayley and Schaefer, 1964)



How does an individual's intelligence change over a lifetime?

cross-sectional method

a research method in which many subjects of different ages are compared on some measure at roughly the same time

longitudinal method

a research method in which measures are taken on the same subjects repeatedly over time

- 4 What about intellectual changes throughout one's whole life span? Does intelligence decrease with age? Perhaps you can anticipate the answer: yes, no, and it depends. Much of the data that we have on age differences in IQ scores have been gathered using a **cross-sectional method**. That is, IQ tests are given at roughly the same time to a large number of subjects of different ages. When that is done, the results seem to indicate that overall, global IQ peaks in the early 20s, stays rather stable for about 20 years, and then declines rather sharply.
- 5 A different approach to the same question would be to test the same individuals over a long period of time. This is the **longitudinal method**. When this technique is used, things don't look quite the same, usually showing IQ scores rising until the mid-50s and then very gradually declining.
- 6 So we have a qualified "yes" and a qualified "no" as answers to our questions about age and IQ so far. Probably the best answer is "It depends." Some studies of cognitive abilities seem to demonstrate that we should ask about specific intellectual skills, because they do not all decline at the same rate, and some do not decline at all. For example, tests of vocabulary often show no drop in scores with increasing age whatsoever, while tests of verbal fluency often show steep declines beginning at age 30.
- 7 Another "it depends" answer comes to the surface when we consider the distinction between what is called *fluid intelligence* and *crystallized intelligence*. It appears that fluid intelligence – abilities that relate to speed, adaptation, flexibility, and abstract reasoning – includes the sorts of skills that show the greatest decline with age. On the other hand, crystallized intelligence – abilities that depend on acquired knowledge, accumulated experiences, and general information – includes the sorts of skills that remain quite constant or even increase throughout one's lifetime.

AFTER YOU READ

Task 1 Reading for detail

Discuss the answers to the following questions with a partner.

- 1 What is the youngest age at which you can test a child's IQ and closely predict the child's adult IQ?
- 2 Does intelligence decrease with age? The author's answer to this question is "yes," "no," and "it depends." Explain why each of these answers is possible.
- 3 What are the differences between collecting cross-sectional data and collecting data longitudinally?
- 4 Give examples to explain what you think the author means by *fluid intelligence* and *crystallized intelligence*. (Look back at the text in Section 2 of Chapter 5, "The Stanford-Binet Intelligence Test," on page 99, for additional information on this topic.)

Task 2 Building vocabulary: Subtechnical vocabulary

Certain words and phrases occur frequently in all academic writing, regardless of the specific academic discipline. Such words are sometimes referred to as subtechnical vocabulary and are particularly important for college students to learn and be able to use.

1► The following words occur in the text. Each of them may be used to describe changes in numerical data over time. Put each word into the correct column, depending on whether it describes an upward change or a downward change.*

decline decrease increase
rise peak drop

↑	↓

*Note that the expressions in the text *remain constant* and *stay stable* are both terms that mean that things stay the same, in other words, that there is no movement up or down.